The Use of Technology for Better Management Decision-Making in a University Library

Anthony S C Hooper
University of Cape Town

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Anthony S. C. Hooper
University of Cape Town
Rondebosch, South Africa

INTRODUCTION

In 1980, after more than ten years of looking at the potential advantages offered to library management by the computerization of library services, the University of Cape Town Libraries proudly possessed a periodicals list generated on the University's mainframe IBM 360, and a FAMULUS listing of projector slides in the architecture library. Attempts to obtain a word processor or microcomputer for the low cost automation of some technical processes were sidelined in the bureaucracy which controlled such things at that time. A series of library management problems which could best be solved by exploiting available computer technology has led to the evolution of a fully integrated system.

FIRST PROBLEM - SHORT LOAN

The major crisis of 1980 was the short loan service, providing the library equivalent of a fast food service to undergraduates, being unable to cope with unexpectedly intense use.

The problem could not be solved by throwing staff and money at it - staff to speed processing and service; money to improve architectural layout and traffic flow. It was essentially a problem of quicker registration of loans and returns being linked to easily generated lists of currently held books and journals required for heavy use by students preparing for tutorials and essays.

Under contract, SACO Systems, a local hardware and software vendor, supplied an Ontel mini-computer system which merged a borrower information file with a book information file to record each circulation transaction. There is nothing particularly unique in such a system today. However, this one was written in an operating language known as SACBOL, to specifications developed by the staff at UCT specifically for this particular application. At the time, no known circulation control systems existed which were capable of handling the extremely short loan periods demanded, recording and registering the high fines imposed for late return of items, and providing for a reservation system which could operate down to half hour tolerances for a week in advance.

Benefits of the system were as follows:

- The need for issue slips was eliminated, and so saved a great deal of time for students completing them, and for staff responsible for their filling.

- Overnight returns received early in the morning could be returned to the shelves that much faster and so back into circulation quicker.

- Staff time spent on handling overdues and fines was significantly reduced.

- The reservation system was greatly improved. Instead of being only able to reserve books for overnight loan on the current day,

provision could be made for reserving items for any time during the day for the current week.

- Evaluation of use was greatly simplified, and lecturers were supplied with reports of use and could thus redesign set work lists, or restructure tutorials accordingly.

- Online enquiry facilities allowed for better retrieval of items by author, classification number, or title number, aside from the printed catalogues which were a by product of the new process. [1]

Nearly ten years old, the system is still running. Because of frequently patched software and hardware running at full capacity it is in imminent danger of collapse. It is being kept operative by a dedicated maintenance contractor, the only one left who is capable of manipulating SACBOL, and ensuring the best use of the existing hardware configuration to maintain response time.

SECOND PROBLEM - CIRCULATION

By 1984, the University of Cape Town had begun implementing its Linear Library architectural policy. For some very cogent aesthetic reasons, growth needs of the library could not be accommodated by building a new library building or by taking over other buildings on campus. In the 1970's the policy was established of building library space into every new building on campus such that, by means of bridges, the library could expand horizontally, and reach out towards each department or faculty. The theory was to make the library more accessible to staff and students, and to distribute the bookstock in a way that books and journals were located near the departments which used them. [2]

Some interesting problems for library management followed, not least being that the bookstock in the library was arranged by Dewey Decimal Classification sequence, whereas the departments and faculties were not situated along the north-south continuum of the campus in the same order! The planning architect described the concept as a "literary bazaar" but I think he spelled bazaar incorrectly. The result fitted into Winston Churchill's dictum that "We shape our buildings; thereafter they shape us". [3] The new layout had major significance for the evolution of the library's computerization programme.

Reaching out into the extremities of the University, a linear library must have several doors through which staff and students can enter or leave. The old Brown circulation system, in which a book card is slipped into a borrower's card, requires that each item borrowed is returned to the circulation counter from which it was borrowed. It became obvious to the staff of the library that academics at UCT could never be expected to remember from which issue desk they had borrowed a book, let alone be persuaded to return the book to that desk. An essential requirement for the success of the new Linear Library concept was a central circulation control system such that books could be borrowed or returned to any issue desk which was most convenient for the borrower. The computerization of circulation processes became a sine qua non for the success of the Linear Library.

The criteria decided upon for the development of the library's new circulation control system were:

- it could be applied at remote locations;
- it would save time and effort for library staff and borrowers;
- it could be centrally managed;
- it could be implemented as soon as possible;
- it was completely compatible with the Short Loan system.

Again SACO Systems were contracted to convert their Short Loan System into a circulation control system, and they had to deliver it for implementation by February 1984, in time for the new academic year in March of that year.

In the event, several problems arose which caused major headaches for the seven months following implementation in February. They included incomplete applications software, systems overload, slow response time, and an unmanageable running take on of stock into the bookstock file. The result was the installation of a second independent processor to handle the extra load and provide backup facilities. This gave sufficient space and power to implement the circulation system in the Medical Library on the Groote Schuur campus some two kilometers away from the main library. [4]

Some hilarious situations arose during that period including the sending out of overdue announcements to academic staff in which we informed them that "a book out on loan" was overdue for return. Unfortunately, because we had not had time to record the bibliographic details into the computerized circulation system we neither knew the author's name or the title of the book. We request them to return the book anyway! One colleague of mine with a sense of humor has framed the overdue notice he received at that time!

PROBLEM THREE - END USER COMPUTING

Library management problems are not only tactical, but of a strategic nature as well. For South African librarians, the mid-1980's generated enormous problems with the purchasing of books and especially research journals, mainly because of the excessive increases in the cost of academic journal subscriptions, coupled with the poor performance of the South African currency unit on international monetary markets. Most librarians were trying to compete with the financial experts in predicting the exchange rate of the Rand on international money markets as far as 15 months in advance of having to pay for renewed journal subscriptions.

With a financial year running from January to December, and most subscription renewals having to be paid for in October to November, living within ones budget became a refined form of roulette. [5,6,7]

At UCT a complex set of databases were developed to assist with the prediction of journal prices, calculate inflation rates, and estimate the likely cost of our basket of journal subscriptions. Fortunately for the library, the dispensers of largesse in the form of personal computers suddenly started making such equipment available on a scale hitherto unheard of. A number of IBM look-alikes were obtained, and using dBase III and Lotus 1-2-3 we were able to develop some very useful management information tools. These have been described in detail by Laburn [8] and Paterson-Jones.[9] The following systems were developed:

- a budgeting system,
- an accounts ledger,
- a serials check in and claim system,
- an acquisitions accounts system,
- the allocation of funds for faculty purchases of library materials, and
- the analysis of the allocations formula for that purpose.

Besides the direct return from better management information which these systems provided, staff of the library became increasingly familiar with computers and what they could do. The extent and level of computer literacy increased remarkably, making the staff of the library more critical of library processes and more aware of what could be done with available technology. Innovation and experimentation proliferated, resulting in the networking of

the various accounting systems into an integrated system. From the grassroots upwards the library was able to build up a momentum towards the development of an integrated library system and at the same time become very critical of the turn-key packages on the market.

PROBLEM FOUR - **SABINET** AND ONLINE DATABASE SEARCHES

The library management problem of making best use of expensive professional person-power has been greatly facilitated by the development of cooperative computer-based bibliographic facilities. In South Africa, the early 1980's saw the development of the South African Bibliographic and Information Network (SABINET). Based on a system developed for the Washington Library Network (WLN), SABINET is a not-for-profit cooperative venture involving all the major South African libraries as members. Although beset by numerous problems, SABINET has enabled participating libraries to make substantial savings in the development of their catalogues, and has greatly facilitated interlibrary loans, cooperative acquisitions programs, etc.

One of the foundation members, UCT has been able to exploit SABINET for the development of its own computerized catalogue, and at the same time to do so exceptionally economically. Over a period of six years, without additional cataloguing staff, UCT Libraries has not only been able to maintain the cataloguing of newly acquired materials, but has also embarked on a retrospective cataloguing programme. To date the library's catalogue in South African MARC format, numbers some 150,000 bibliographic records. By the end of 1991, as a result of a contract with a private company, it is expected that all 400,000 bibliographic records will be entered onto the SABINET database.

Similarly, the availability of DIALOG and other cooperative databases has greatly simplified bibliographic control of journal and report literature for UCT students and academics. With access via the international telecommunications networks, although expensive, research scientists at UCT made substantial use of this online facility, and enabled library staff to hone their professional expertise to the same level as that expected from library professionals in any other part of the world.

During 1990, a move was made away from online database searches towards the exploitation of compact disk technology. Currently a number of CD-ROM databases are subscribed to and the Library's in-house Novelle network forms the basis for online searches of Current Contents: Life Sciences to certain select departments in the University.

PROBLEM FIVE - AN INTEGRATED SYSTEM

With the proliferation of a variety of computerized solutions to library management problems, based on different generations of technology, a greater degree of integration became necessary. While there are advantages to be gained from in-house PC-based solutions, they tend to be idiosyncratic and often incompatible. The development of a fully integrated, stand-alone system for the library had long been the objective of the Library Committee. Finally, a commitment to fund such a facility was obtained from the University's Vice-Chancellor and the search for an appropriate system began.

Given the variety of in-house PC-based systems, the packages offered were viewed with skepticism and no small degree of computer competence by library staff. An essential component of any new system was that it should provide the possibility of integrated data use for acquisitions, cataloguing, and circulation functions, but at the same time provide the possibility of end-user computing of specialized data. This specialized data had to be derived from the system but "massaged" for management decision-making

purposes. For example, while the serials control and budgeting function had to be operative, the basic information provided by that function had to be accessible to the library's research and development officer so that trends or performance measurements could be monitored for planning purposes. Acquisitions, accounts ledger, and staffing information had to be subject to further manipulation by staff concerned to ensure better management decision making.

In the end, a system based on an IBM AS/400 was purchased. The system is being implemented over a five year period, of which 1991 is the second year. All eight branches of the library have been networked to the central processor, on which an Online Public Access Catalogue (OPAC) is currently running. In due course it is anticipated that the OPAC will be accessible to all departmental or personal computers linked to the university's fibre-optics communications backbone.

Phase two will replace the obsolete circulation and short loan control system in such a way that staff and student borrower data from central administration files can be merged with the bibliographic data of the OPAC to record loan transactions. This new circulation control facility will be implemented in the main Linear Library as well as all 8 branch libraries around the campus.

Phase three will bring in to the system the technical processes of acquisitions and serials control, and the budgeting and accounting functions. Finally electronic mail and other management information and office automation facilities will be implemented, preserving and enhancing the end-user computing facility currently enjoyed by staff on their networked PCs.

CONCLUSIONS

The advantage of the process described has been that computerization of the University of Cape Town's Library system has evolved in logical and handleable steps. Staff became adjusted to the idea and reality of computerization in a comparatively non-threatening and non-threatened way. Computer literacy spread rapidly and the process of computerization was encouraged from a grass-roots level upwards.

The end result is expected to be a fully integrated library system with provision being made for innovative, end-user processing. This should ensure better utilization of resources and greater efficiency from all levels of personnel.

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